

### **REMARKS**

This responds to the Office Action mailed on December 4, 2006.

By this response, claims 1, 2, 5-7, 22-25, 27, 29, 32 and 33 have been amended, and claims 21 and 26 have been canceled. No new claims have been added. The drawings have been corrected. As a result, claims 1-9, 22-25, and 27-40 are now pending in this application. Applicant requests reconsideration of these claims in view of the above amendments and the following remarks.

#### **Drawing Corrections**

By this response, Applicant has corrected drawings that include the film or compressible film. The applicant has submitted additional FIGs 13A and 13B which show the application of the film and a device to compress the film. Support for these drawings is found in the specification at page 6, lines 18 to page 7, line 7 as well as in the is found in FIGs. 4 and 6 and the discussion related to these figures.

#### **§102 Rejection of the Claims**

**A. Rejection:** Claims 1-4, 21-23, 25, and 33 were rejected under 35 USC § 102(b) as being anticipated by Murali et al. (U.S. 6,248,951 B1).

**B. Response:** Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, "[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added).

Claim 1, as amended, now recites "...placing a compressible film onto a backside surface of the die; compressing the film; and placing a pressurized material in contact with at least a

portion of the die and the substrate after the capillary underfill.” In the Murali et al. reference a mold 42 is placed over the integrated circuit and an encapsulant is injected into the mold. (see column 2, lines 51-54 of Murali et al.). Murali et al. fails to teach the elements of placing a compressible film onto a backside surface of the die, and compressing the film. The figures of Murali et al. also fail to disclose any type of film much less compressing the same. As a result, claim 1 now overcomes the Examiner’s rejection under 35 USC § 102(b) as being anticipated by Murali et al. (U.S. 6,248,951 B1).

Claims 2-4 depend from claim 1 and include the limitations of claim 1 by their dependency. Since the Murali et al. reference fails to teach each and every element of the invention, and also fails to teach all the elements arranged as in the claims, it is submitted that claims 2-4 now also overcome the Examiner’s rejection under 35 USC § 102(b) as being anticipated by Murali et al. (U.S. 6,248,951 B1).

Claim 1 now recites “...placing a compressible film onto a backside surface of the die; compressing the film; and placing a pressurized material in contact with at least a portion of the die and the substrate after the capillary underfill.”

**C. Rejection:** Claims 21-26 and 29 were rejected under 35 USC § 102(b) as being anticipated by Miyazaki et al. (U.S. 2002/0008316 A1).

**D. Response:** By this amendment, claims 21 and 26 have been canceled. The recitations of these claims were incorporated into claim 27 which has been placed into allowable form. Claims 22-25 and 29 have been amended to depend from claim 27 and are therefore also thought to be allowable since each of these claims now recites elements not found in the Miyazaki et al. reference. Accordingly, claims 22-25 and 29 now overcome the Examiner’s rejection under 35 USC § 102(b) as being anticipated by Miyazaki et al. (U.S. 2002/0008316 A1).

§103 Rejection of the Claims

**A. Rejection:** Claims 6-9 and 39 were rejected under 35 USC § 103(a) as being unpatentable over Murali et al. (U.S. 6,248,951 B1) as applied to claim 1 above, and further in view of Hembree (U.S. 6,117,797 B1).

**B. Response:** With respect to claims 6-9, the dependency of claims 6 and 7 has been changed to claim 5. Claim 5 was indicated allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicant has amended claim 5 into allowable form and, as a result, claims 6 and 7 are also thought to be allowable. Claims 8 and 9 depend from claim 7 and are also thought to be allowable.

In order for the Examiner to establish a prima facie case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. M.P.E.P. § 2142 (citing *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Claim 39 depends from claim 1 and, therefore, includes all the recitations of claim 1 by its dependency. Claim 1 now recites "...placing a compressible film onto a backside surface of the die; compressing the film; and placing a pressurized material in contact with at least a portion of the die and the substrate after the capillary underfill." In the Murali et al. reference a mold 42 is placed over the integrated circuit and an encapsulant is injected into the mold. (see column 2, lines 51-54 of Murali et al.). Murali et al. fails to teach or suggest the elements of placing a compressible film onto a backside surface of the die, and compressing the film. The figures of Murali et al. also fail to disclose any type of film much less compressing the same. The Hembree (U.S. 6,117,797 B1) reference also fails to teach or suggest the elements of placing a compressible film onto a backside surface of the die, compressing the film, or placing a pressurized material in contact with at least a portion of the die and the substrate after the

capillary underfill. Therefore, the Examiner's rejection is now overcome since the combination of references suggested by the Examiner fails to teach or suggest all the claim limitations.

In addition, there is no reason to combine Murali et al. and Hembree since Hembree teaches away from the invention as now claimed. Hembree teaches away from such an arrangement since the backside surface (element 18 of Hembree) is initially bonded to the substrate (see column 4, lines 53-55 of Hembree) leaving no backside surface on which to place a film and no need to compress the backside surface. In addition, there is no capillary underfill used since the backside is already bonded to the substrate. This teaching away is evidence of a reason not to combine these two references. As a result, claim 39, via its dependency on claim 1, now overcomes the Examiner's rejection under 35 USC § 103(a) as being unpatentable over Murali et al. (U.S. 6,248,951 B1) as applied to claim 1 above, and further in view of Hembree (U.S. 6,117,797 B1).

**C. Rejection:** Claims 34-35 were rejected under 35 USC § 103(a) as being unpatentable over Murali et al. (U.S. 6,248,951 B1) as applied to claim 1 above, and further in view of examiner's official notice.

**D. Response:** In order for the Examiner to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. M.P.E.P. § 2142 (citing *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Claims 34-35 each depend from claim 1 and, therefore, include all the recitations of claim 1 by their dependency. Claim 1 now recites "...placing a compressible film onto a backside surface of the die; compressing the film, and placing a pressurized material in contact with at least a portion of the die and the substrate after the capillary underfill." In the Murali et

al. reference a mold 42 is placed over the integrated circuit and an encapsulant is injected into the mold. (see column 2, lines 51-54 of Murali et al.). Murali et al. fails to teach or suggest the elements of placing a compressible film onto a backside surface of the die, or compressing the film. The figures of Murali et al. also fail to disclose any type of film much less compressing the same. The Examiner's Official Notice, directed toward etching the devices, does not fill gap in what is neither taught nor suggested in the Murali et al. reference. Therefore, the Examiner's rejection is now overcome since the combination of Murali and the Examiner's Official Notice regarding etching fails to teach or suggest all the claim limitations. As a result, claims 34-35, via their dependency on claim 1, now overcomes the Examiner's rejection under 35 USC § 103(a) as being unpatentable over Murali et al. (U.S. 6,248,951 B1) as applied to claim 1 above, and further in view of examiner's official notice.

**E. Rejection:** Claim 32 was rejected under 35 USC § 103(a) as being unpatentable over Miyazaki et al. (U.S. 2002/0008316 A1) as applied to claim 21 above, and further in view of examiner's official notice.

**G. Response:** By this amendment, claim 32 has been amended to depend from claim 27. Claim 27 has been indicated as allowable if placed in allowable form. As mentioned above, claim 27 has been placed in allowable form. As a result, claim 32 is now also thought to be allowable since the claims now recite elements not found in the Miyazaki et al. reference nor provided for in the Examiner's Official Notice. Accordingly, claim 32 now overcomes the Examiner's rejection under 35 USC § 103(a) as being unpatentable over Miyazaki et al. (U.S. 2002/0008316 A1) as applied to claim 21 above, and further in view of examiner's official notice.

*Allowable Subject Matter*

Claims 5 and 27 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 5 and 27 have been rewritten to the allowable form suggested by the Examiner.

*Conclusion*

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney ((612) 373-6977) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

**Reservation of Rights**

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

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Title: CAPILLARY UNDERFILL AND MOLD ENCAPSULATION METHOD AND APPARATUS

Assignee: Intel Corporation

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priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

Respectfully submitted,

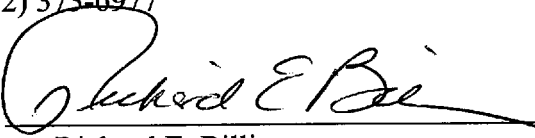
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5th day of March 2007.

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